

General Description

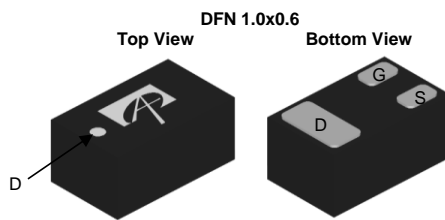
The AON1605 utilize advanced trench MOSFET technology in small DFN 1.0 x 0.6 package. This device is ideal for load switch applications.

Product Summary

V_{DS}	-20V
I_D (at $V_{GS}=-4.5V$)	-0.7A
$R_{DS(ON)}$ (at $V_{GS}=-4.5V$)	< 710m Ω
$R_{DS(ON)}$ (at $V_{GS}=-2.5V$)	< 930m Ω
$R_{DS(ON)}$ (at $V_{GS}=-1.8V$)	< 1250m Ω

Typical ESD protection

HBM Class 1C



Absolute Maximum Ratings $T_A=25^\circ\text{C}$ unless otherwise noted

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 8	V
Continuous Drain Current ^E	I_D	$T_A=25^\circ\text{C}$	-0.7
		$T_A=70^\circ\text{C}$	-0.55
Pulsed Drain Current ^C	I_{DM}	-2	A
Power Dissipation ^A	P_D	$T_A=25^\circ\text{C}$	0.9
		$T_A=70^\circ\text{C}$	0.55
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ^A $t \leq 10\text{s}$	$R_{\theta JA}$	80	100	$^\circ\text{C/W}$
Maximum Junction-to-Ambient ^A Steady-State		110	140	$^\circ\text{C/W}$
Maximum Junction-to-Ambient ^B $t \leq 10\text{s}$	$R_{\theta JA}$	200	245	$^\circ\text{C/W}$
Maximum Junction-to-Ambient ^B Steady-State		280	340	$^\circ\text{C/W}$

Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV _{DSS}	Drain-Source Breakdown Voltage	I _D =-250μA, V _{GS} =0V	-20			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-20V, V _{GS} =0V T _J =55°C			-1 -5	μA
I _{GSS}	Gate-Body leakage current	V _{DS} =0V, V _{GS} =±8V			±10	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-0.4	-0.7	-1.1	V
I _{D(ON)}	On state drain current	V _{GS} =-4.5V, V _{DS} =-5V	-2			A
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-4.5V, I _D =-0.4A T _J =125°C		590	710	mΩ
				835	1010	
		V _{GS} =-2.5V, I _D =-0.3A		745	930	mΩ
		V _{GS} =-1.8V, I _D =-0.2A		955	1250	mΩ
		V _{GS} =-1.5V, I _D =-0.1A		1115		mΩ
g _{FS}	Forward Transconductance	V _{DS} =-5V, I _D =-0.4A		1		S
V _{SD}	Diode Forward Voltage	I _S =-0.4A, V _{GS} =0V		-0.85	-1.2	V
I _S	Maximum Body-Diode Continuous Current ^E				-0.7	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-10V, f=1MHz		50		pF
C _{oss}	Output Capacitance			12		pF
C _{riss}	Reverse Transfer Capacitance			7.5		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz		45		Ω
SWITCHING PARAMETERS						
Q _g	Total Gate Charge	V _{GS} =-4.5V, V _{DS} =-10V, I _D =-0.4A		0.75		nC
Q _{gs}	Gate Source Charge			0.15		nC
Q _{gd}	Gate Drain Charge			0.2		nC
t _{D(on)}	Turn-On DelayTime	V _{GS} =-4.5V, V _{DS} =-10V, R _L =25Ω, R _{GEN} =3Ω		6		ns
t _r	Turn-On Rise Time			5		ns
t _{D(off)}	Turn-Off DelayTime			22		ns
t _f	Turn-Off Fall Time			8		ns

A: The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25° C. The Power dissipation P_{DSM} is based on R_{θJA} and the maximum allowed junction temperature of 150° C. The value in any given application depends on the user's specific board design, and the maximum temperature of 150° C may be used if the PCB allows it to.

B: The value of R_{θJA} is measured with the device mounted on FR-4 minimum pad board, in a still air environment with T_A=25° C. The Power dissipation P_{DSM} is based on R_{θJA} and the maximum allowed junction temperature of 150° C. The value in any given application depends on the user's specific board design, and the maximum temperature of 150° C may be used if the PCB allows it to.

C: The static characteristics in Figures 1 to 6 are obtained using <300 μs pulses, duty cycle 0.5% max.

D: These tests are performed with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25° C. The SOA curve provides a single pulse rating.

E: The maximum current limited by package.

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

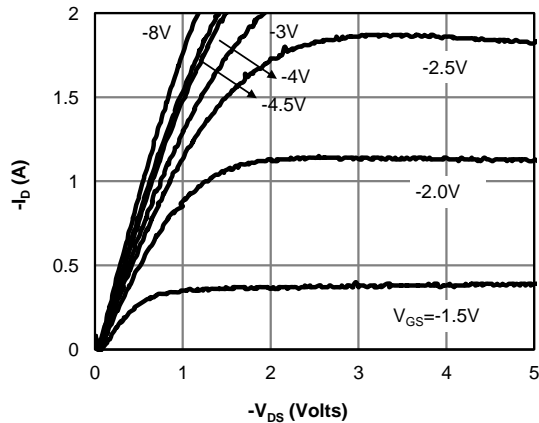


Fig 1: On-Region Characteristics (Note E)

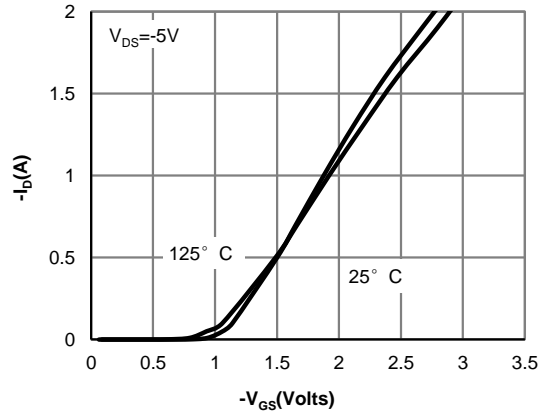


Figure 2: Transfer Characteristics (Note E)

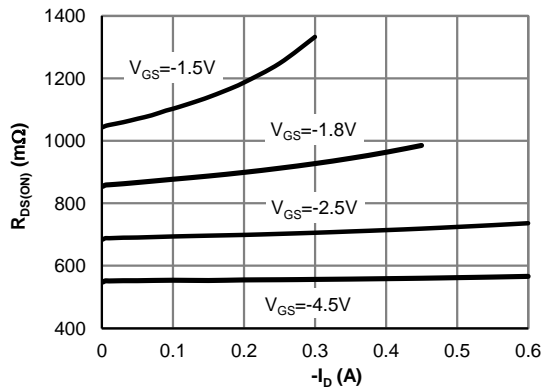


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

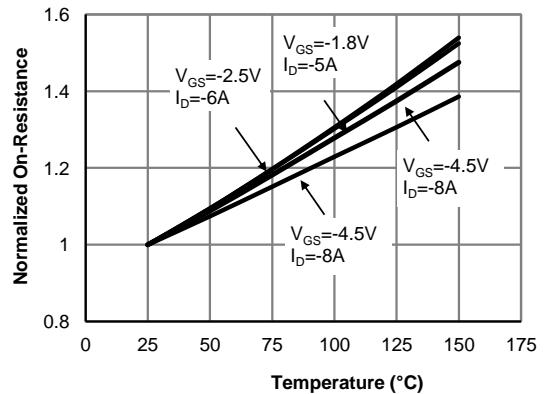


Figure 4: On-Resistance vs. Junction Temperature (Note E)

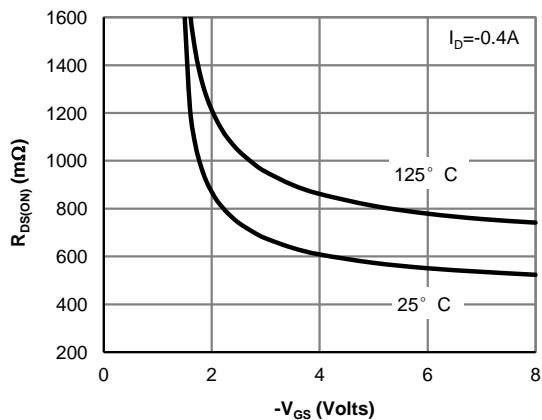


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

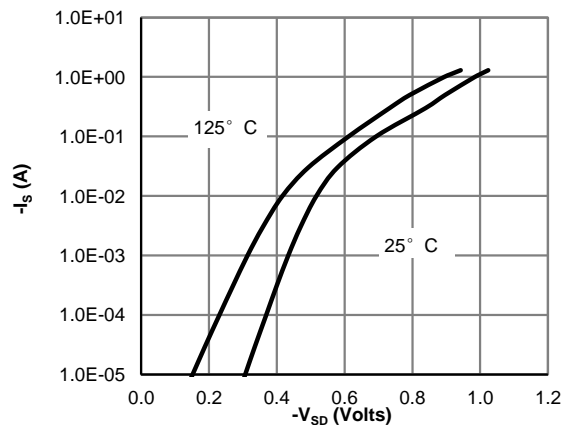


Figure 6: Body-Diode Characteristics (Note E)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

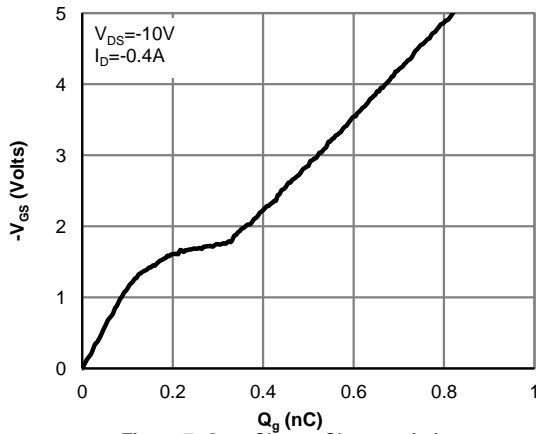


Figure 7: Gate-Charge Characteristics

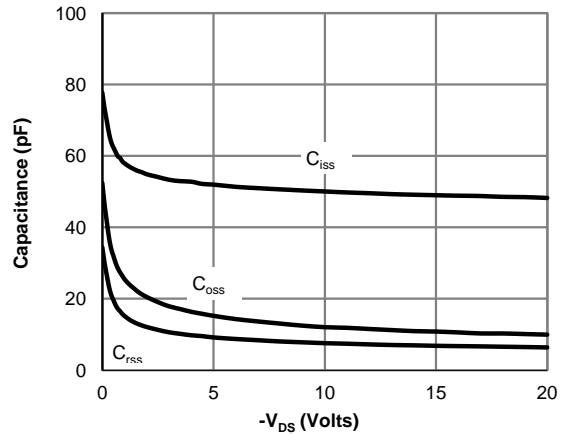


Figure 8: Capacitance Characteristics

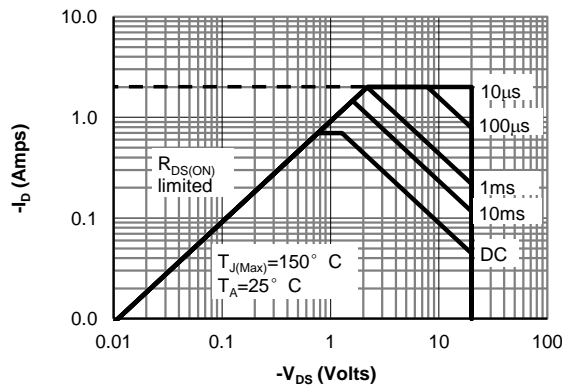


Figure 9: Maximum Forward Biased Safe Operating Area (Note B)

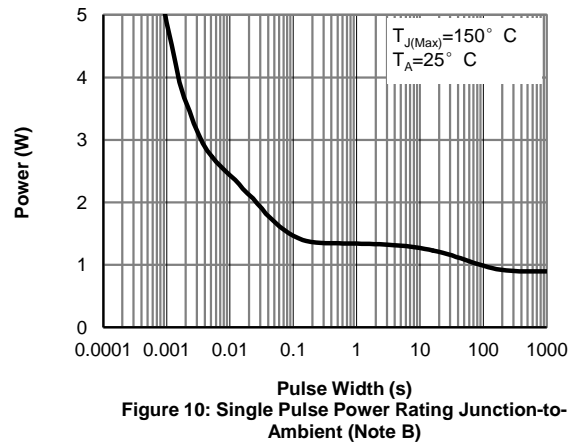


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note B)

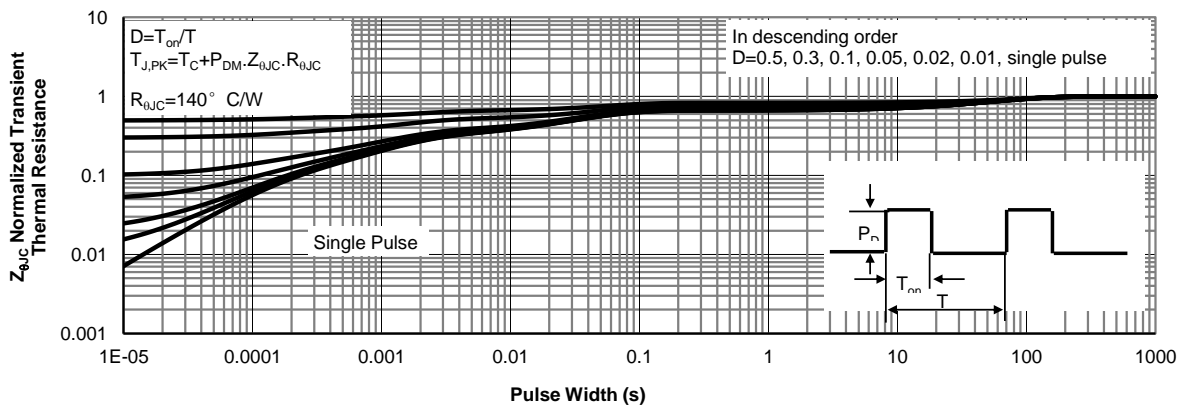
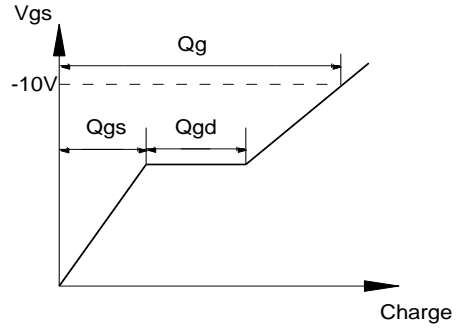
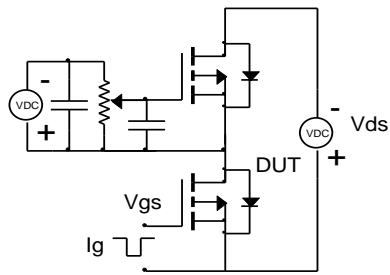
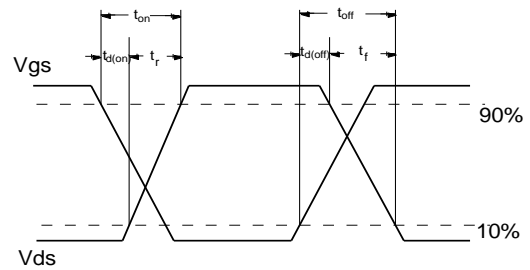
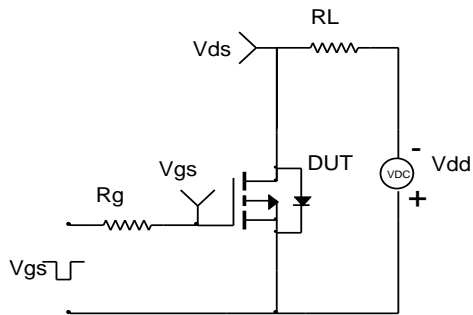


Figure 11: Normalized Maximum Transient Thermal Impedance (Note B)

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



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